

CLAIMS:

- 1) A device comprising first and second inlet passages for respective immiscible fluids, the first and second inlet passages merging into a third passage along which the two fluids flow under parallel laminar flow conditions, the third passage being formed with a constriction or other discontinuity causing the two fluids to form into a flow of alternate segments.
- 2) A device as claimed in claim 1, in which downstream portions of the inlet passages extend parallel with each other before merging to form the third passage.
- 3) A device as claimed in claim 1 or 2, in which said discontinuity in the third duct comprises a region of changed surface energy.
- 4) A device as claimed in claim 1 or 2, in which said discontinuity comprises a region of altered or alterable contact angle.
- 5) A device as claimed in claim 1 or 2, in which said discontinuity comprises one or more further passages joining the third passage.
- 6) A device as claimed in any preceding claim, comprising a further inlet passage for a third fluid, the further inlet passage merging into the third passage upstream of the constriction or other discontinuity.
- 7) A device as claimed in any preceding claim, in which the third or outlet passage is formed with a second constriction or discontinuity downstream of the first

constriction or discontinuity.

8) A device comprising a passage for the flow of alternating segments of two immiscible fluids, the passage having an enlargement in cross-section.

5 9) A device comprising a main passage for the flow of alternating segments of two immiscible fluids, the passage splitting into a number of passages of smaller cross-section.

10) A device comprising a main passage for the flow of alternating segments of two immiscible fluids, and one or more 10 passages joining the main passage and providing for the inlet of one or more additional fluids.

11) A device comprising a passage for the flow of alternating segments of immiscible fluids, and radiation means for cross-linking or polymerizing at least a surface layer of 15 the segments of one fluid.

12) A device comprising first and second inlet passages for respective immiscible fluids, the first and second passages merging into a third passage along which the two fluids flow under parallel laminar flow conditions, the third passage 20 splitting into first and second outlet passages, with one fluid passing into the first outlet passage and both fluids passing, as alternating segments, into the second outlet passage.

13) A device comprising first and second inlet passages, one for a first fluid and the second for alternating segments 25 of the first fluid and a second fluid with which the first fluid is immiscible, the inlet passages merging into a third passage along which the two inlet flows pass in parallel manner, and the third passage splitting into first and second outlet passages along which, respectively, the first and second

fluids flow.

14) A device comprising an inlet passage for the flow of alternate segments of first and second immiscible fluids, a first outlet passage interfaced with the inlet passage via a 5 membrane permeable to the first fluid, and a second outlet passage for the flow of the second fluid.

15) A device comprising first and second inlet passages each for the flow of alternate segments of two immiscible fluids, and means for combining the two flows into a third 10 passage, such that the alternate segments of one flow combine with the corresponding alternate segments of the other flow.

16) A device as claimed in any one of the claims 8 to 11 or 13 to 15, further comprising means for generating said flow of alternate segments of immiscible fluids.

15 17) A device comprising a first passage for the flow of two fluids in parallel laminar flow conditions, a second passage for the flow of a fluid which is immiscible with said two fluids, the first and second passages merging into a third passage in which the three fluids flow in parallel laminar flow 20 conditions, the third passage being formed with a constriction or other discontinuity causing the fluids to form into a flow of alternate segments.

18) A device which comprises two substrates disposed face-to-face, the surface of at least one of the substrates being 25 profiled such that one or more fluid flow passages are defined between the two substrates, the two substrates being held together by two outer members.

19) A device as claimed in claim 18, in which the two outer members are welded directly to each other or via an

intermediate metallic layer.

- 20) A device which comprises two substrates disposed face-to-face, the surface of at least one substrate being profiled such that one or more fluid flow passages are defined between
5 the two substrates, the two substrates being welded together via an intermediate metallic film.